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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,249	12/27/2004	Shmuel Ben-Yaakov	0-04-107	1627

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EXAMINER	
A, MINH D	

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/502,249	BEN-YAAKOV, SHMUEL	
	Examiner	Art Unit	
	Minh D. A	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 10-12 and 15-* is/are rejected.

7)☒ Claim(s) *7-9,13,14 and 16-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/22/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-6, 10-12, 15 are rejected under 35 U.S.C. 102(a) as being unpatentable by Lee et al (US 6,333,606).

Regarding claim 1, Lee discloses a ballast for discharge lamp for driving an electric load with low-frequency AC current, comprising: a) a current splitting inductor(21) for generating from said high-frequency current source, a first and a second high-frequency AC current sources; b) a rectifier(BD) coupled to said splitting inductor(21), consisting of rectifying diodes for rectifying said first and second high-frequency current sources, and capacitors (C1), charged by said diodes, said capacitors being corresponding to a first and second DC current sources;

c) a controllable half-bridge commutator(BD) having a first and a second control inputs, said commutator (BD) being coupled to said DC current sources, for commutating said DC current sources, for allowing to generate, from said DC current sources, the low-frequency AC current required for driving said electric load; and

d) a control circuitry (50), having a first and a second outputs, said outputs being coupled to said first and second control inputs, respectively, and outputting two complimentary pulse trains, each of which having a frequency being automatically adjusted according to the operating conditions of said electric load, for controlling the switching time of said commutator (BD), thereby causing said commutator to alternately change the direction of the current passing through said electric load. See figures 1-2, col.2, lines 15-67 to col.4, lines 1-47.

Regarding claim 2, Lee discloses the electric load is a High Intensity Discharge (HID) lamp which is controlled by the magnitude of the low-frequency AC current and by the switching frequency of the commutator, respectively. See figure 1.

Regarding claim 3, Lee discloses the rectifier is implemented by utilizing diodes in a full-bridge or half-bridge configuration. See figure 1.

Regarding claim 4, Lee discloses the half-bridge commutator is implemented by utilizing a first and a second controllable switching means, said switching means being, whenever desired, alternately switched from conductive state to non-conductive state. See figures 1-2.

Regarding claim 5, Lee discloses the first and second controllable switching means are transistors. See figures 1-2.

Regarding claim 6, Lee discloses a resonant ignition circuit, for generating the voltage required for cold-ignition of the HID lamp, comprising:

a) a capacitance, being coupled in parallel to the HID lamp; and

b) an inductor, being connected in series with respect to the lamp, said inductor forming a serial resonant circuit with said capacitor, wherein the resonant frequency of said serial resonant circuit is selected to be higher than the operating frequency of the current passing through said HID lamp. See figures 1-2.

Regarding claim 10, Lee discloses the operating condition is the cold, or hot, ignition phase, during which the frequency of the pulse trains is close to the resonance frequency of the resonant ignition circuitry, or an intermediate phase, during which the frequency of the pulse trains gradually decreases, or the normal state, during which the frequency of the pulse trains is relatively low, and essentially constant. See col.2, lines 15-67 to col.4, lines 1-47.

Regarding claim 11, Lee discloses the current splitting inductor is implemented by an autotransformer, thereby allowing utilizing a relatively low AC voltage source. See figure 1.

Regarding claim 12, Lee discloses the current splitting inductor is implemented by a transformer, for allowing isolation between the signal source side and the load side. See figure 1.

Regarding claim 15, Lee discloses the high-frequency AC current source is implemented by utilizing an input circuitry in a Flyback configuration, said circuitry being placed between a DC voltage source and the current splitting inductor, comprising: a) transformer, the primary side of which being an input inductor (L1), a first contact of which could be connected to a DC power source, and the secondary side of which being the current splitting inductor; and

b) a controllable switch (Q14), a first contact of which being coupled to a second contact of said input inductor (L1), and a second contact of which being coupled to ground, said controllable switch (Q14) causes said input inductor (Li) to store energy whenever said controllable switch being in its conductive state, and to forward at least some of the stored energy to said current splitting inductor whenever said controllable switch is in its non-conductive state. See figure 1, col.2, lines 15-67 to col.4, lines 1-47.

Allowable Subject Matter

2. Claims 7-9, 13-14, 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art does not teach that, a)an autotransformer (Lr), one portion of which being connected in series with said resonant ignition circuitry, the inductor of which being the secondary side of a transformer and part of said resonant ignition circuitry, the primary side of which having a first end coupled to a first end of a capacitor, b)a spark gap (SPRK), one end of which being coupled to a second end of said primary side, and a second end of which being coupled to a second end of said capacitor, said SPRK introduces a high impedance whenever the voltage across it is lower than a predetermined breakdown value, and a momentarily low impedance whenever the voltage across it exceeds said breakdown value; and c)a rectifier, being fed by a second portion of said autotransformer, for allowing the energy, required for hot-ignition, to be stored in

said capacitor, said energy being forwarded to said secondary side, whenever said SPRK introduces a low impedance, thereby allowing to obtain the voltage required for hot-ignition of said lamp recited in dependent claim 7.

Prior art does not teach that, resonant Inverter (CS-PPRI), being placed between a DC voltage source and the current splitting inductor, comprising:

a) a transformer, the primary side of which having a first and a second input inductors, and the secondary side of which being the current splitting inductor;

b) a first Inductor (Lc), a first contact of which being coupled to a first contact of said first input inductor, and a second contact of which being coupled to a first contact of said second input inductor;

c) a resonant Capacitor (Cc), a first contact of which being coupled to a second contact of said first input inductor, and a second contact of which being coupled to a second contact of said second input inductor, said resonant capacitor, first Inductor (Lc) and input inductors forming a Parallel Resonant Circuitry (PRC), for allowing generating an alternating current source;

d) a second Inductor (Lin), a first contact of which could be connected to a DC power source and a second contact of which being connected to a middle contact of said first Inductor (Lc), the inductance of said second Inductor (Lin) being larger than the inductance of said first Inductor (Lc), for allowing said second Inductor (Lin) to generate the current required for driving said PRC;

e) a first controllable switch (Q12), a first contact of which being coupled to said first contact of said capacitor, and a second contact of which being coupled to ground;

f) a second controllable switch (Q13), a first contact of which being coupled to said second contact of said capacitor, and a second contact of which being coupled to said ground; and

g) a Soft Switching Controller (SSC), for soft switching said second and third switches (Q12, Q13), the input of said SSC being fed with a signal representing the instantaneous magnitude of the signal at the second contact of said second Inductor (Lin), said SSC generates two complementary trains of digital signal, one of said trains being fed to an input terminal of said second switch (Q12) and the second train being fed to an input terminal of said third switch (Q13), for causing them to alternately switch from conductive to non-conductive state in synchronization with the instants at which said instantaneous magnitude reaches essentially a zero value, only one switch being in its conductive state at a given time recited in dependent claim 14.

Prior art does not teach that, a)a first and second windings of a current transformer, each of which being connected in series with the corresponding first and second high-frequency current sources, for sampling the current passing through the corresponding current source; b)a rectifier, for generating a first signal being representative of the rectified sampled currents; c)a first amplifier, having at least one reference input, being connected to a constant reference value, and a signal input, to which said first signal is forwarded, for generating an error signal representing of the deviation of said first signal from said reference value; and d) a current mode PWM modulator, having a first input, to which said error signal is forwarded, a second input, to which a second signal, representing

the current of the high-frequency AC current source, is fed, and at least one output, for outputting a corresponding train of pulses, the duty-cycle of which is a function of said error signal and of said second signal, and being connected to a corresponding driver, the output of which being coupled to the corresponding controllable switch, for controlling its switching time, for causing the current passing through the HID lamp to be at the required value, thereby completing said feedback recited in dependent claims and 16 and 18.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Okude et al (US 5,502,423) and Naruo et al (US 6,246,181) to show a lighting control system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Minh A whose telephone number is (571) 272-1817. The examiner can normally be reached on M-F (5:30 –2:30 PM).

If attempts to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and (703) 872-9319 for final communications.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center receptionist whose telephone number is (571) 272-1553.

Primary Examiner

Examiner

Minh A

Art unit 2821

12/09/05